Single-Dose Treatment of Enterobiasis

Use of a New Piperazine-Senna Preparation

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• **A preparation combining piperazine and senna was clinically tested among 31 families in which at least one member was found to be positive for enterobiasis by the customary cellophane-tape anal smear technique. The diagnostic smears were positive for 58 of those tested. Following a single dose of piperazine-senna mixture, all patients were cleared of the infestation as determined by the customary criteria for cure. In six patients in two families, reinfestation occurred in two to three months after the first administration. All were again cleared with one dose of the mixture.**

Side effects were insignificant and transient. One 4-year-old child vomited, but an hour later ingested a second dose without incident. The preparation was palatable and easily administered.

PINWORMS are commonly encountered in pediatric practice. In a study of pinworm infestation in San Francisco some years ago an incidence of 29 per cent in boys and 34 per cent in girls was noted.[10] In a more recent investigation of infestation in children in a housing development for married ex-servicemen studying at the University of California at Los Angeles, the incidence was 43.3 per cent.[11] Several other studies[2,7,10] suggest that a 30 to 40 per cent incidence is common among white children in various parts of the country.

It has generally been considered that pinworm infestation is relatively harmless and, except for pruritus ani, largely asymptomatic. Recently, however, in a report of a ten-year study, Litter[5] cited instances of a number of rather severe pathological consequences of enterobiasis, the variety implicating the fields of dermatology, gastroenterology, gynecology, neurology, proctology, psychiatry and others. As far as we have been able to observe, symptomatology has been limited to pruritus, irritability and restlessness, anorexia, insomnia, abdominal pain and excoriations of the anal, perianal and rectal areas. Prolonged insomnia and irritability can, of course, result in behavioral difficulties, and anorexia can cause physical damage.

Until the advent of piperazine less than a decade ago, pinworm therapy was a comparatively uncertain undertaking. Piperazine quickly emerged as the drug of choice because of its efficacy and relative lack of toxicity. Even with this drug, however, there is the problem of administration on seven successive days, a rather cumbersome procedure, particularly with young children. Currently, pyrvinium pamoate, a cyanine dye, is employed and is effective in a single dose. It does cause vomiting in some young patients, however, and the dye stain presents problems, particularly since its appearance in the stool creates alarm even among some previously-warned parents.

According to recent reports in the literature,[3,9,12] a new preparation combining time-tested piperazine and standardized senna has proved effective in treating enterobiasis with a single dose and without significant side effects. Presumably, the piperazine acts by narcotizing the worms, and the senna flushes them out before they can recover.[12]

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METHOD AND MATERIALS

All members of thirty-one families, in which at least one member was found to be positive for enterobiasis by the usual modified National Institutes of Health scotch-tape smear technique, were administered the new piperazine-senna preparation* in palatable chocolate-flavored granular form. Early in the study, in an effort to determine the optimal procedure, patients were given varying instructions concerning the time of administration. In the latter stages, the patients were directed to take the preparation before or at breakfast. They were told they could take it directly from a spoon or in milk or on cereal. All were instructed to record reactions at the time of ingestion and subsequent bowel movements. They were given dated slides and scotch-tape, and instructed in the technique of anal smears. Starting on the eighth day after treatment, these were taken on six consecutive mornings before bathing or wiping the anal areas. A seventh post-treatment smear was taken in the office by the investigator on the morning after the sixth smear. All pretreatment diagnostic smears were administered personally by the investigator, and all slides,

*Pripsen Granules, supplied by the Medical Department of The Purdue Frederick Company, New York, N. Y.

pretreatment and post-treatment, were examined by the investigator.

For children up to six years of age the dose prescribed was one level teaspoonful of the mixture, each teaspoon containing 1 gm. of piperazine phosphate and the standardized concentrate of 450 mg. of senna pods. For children of six to eleven years the dose was two teaspoonfuls, and for adults four teaspoonfuls. There were no children older than 11 years.

For purposes of the study, only patients with positive pretreatment smears were included in the results. If all seven post-treatment smears were negative, the treatment was evaluated as successful.

RESULTS

A total of 58 patients, including 54 children from 6 months to 11 years and four adults, had positive diagnostic smears. The ages of the 54 children averaged 4 years, with seven under one year, 22 from 1 to 3 years, 19 from 4 of 8 years, and six over 8 years. Of the children, 33 were female and 21 male. The adults included two couples, one with three children and the other with four children positive for enterobiasis. Eighteen of the 58 had no symptoms. In 21, the only symptom was pruritus. Other symptoms—singly, or combined with pruritus or with one another—included severe irritability and restlessness, anorexia, insomnia, abdominal pain and pronounced lethargy. Physical findings included excoriations in the anal, perianal and rectal areas. Worms were seen only in one case.

All 58 patients were evaluated as cured* with a single dose of the preparation. In six cases, however, there was reinfestation from two to three months later initially manifested in a recurrence of pruritus. Two of the six were siblings who had had positive smears before treatment, and the other four were the parents and two out of four siblings of another family, all of whose members had had positive smears the first time. In each case, a single dose of the preparation again resulted in eradication of the pinworm. Counting only those who had positive smears before treatment, there were thus 64 separate administrations of the piperazine-senna pod mixture, all of which resulted in eradication of pinworm infestation following a single dose.

In 35 of these 64 cases there were no side effects whatever reported, and in another 24 the only effects were transient looseness of bowels or slight and transient cramps. In none of these 24 cases were the side effects of any significance. Three other patients had cramps, but all of them had complained of intermittent cramps before the study. One other patient, a mother, said she thought she had cramps but that they might have been psychologically induced by the instructions. One patient, a 4-year-old boy, vomited on first administration of the preparation. An hour later, he ingested a dose without difficulty. There were no cases of true diarrhea and none in which hydration was affected—an important safety consideration where young children are concerned.

There were 68 members of the 31 families in the study who had negative diagnostic smears. All were given the medication in the same manner as those with positive smears. All of them still were negative on post-treatment examination with seven successive daily anal smears.

COMMENT

In this study, the piperazine-senna combination appeared to have medical characteristics approaching those recently described as ideal for enterobiasis therapy[8]: the effective cure rate was 100 per cent; it was non-toxic in the doses given, and both piperazine[1] and senna[4] are reported to be non-toxic in large doses; it was palatable and easily administered; and its efficacy with a single dose makes it suitable for mass administration to family groups and institutional populations.

Its palatability made it considerably more acceptable than has been our experience with pyrvinium pamoate or piperazine alone—an advantage particularly in treatment of young children. Although side effects were minimal as compared with pyrvinium pamoate, it appears in retrospect that the incidence of minor cramping and loose stools might have been lessened by a reduction in dose for children of 3 years and under, without loss of efficacy. Two-thirds of the patients who had these side effects were in this age group. All received a teaspoonful of the preparation. It was also our clinical impression that there was far less cramping reported by patients who were administered the test material in the morning, before or at breakfast.

The single-dose effectiveness of the piperazine-senna preparation simplified administration enormously in comparison with piperazine alone. Although none of the studies carried out by other investigators with this preparation achieved 100 per cent cure with the one dose, as ours did, they did demonstrate a high degree of efficacy—ranging from 93.3 per cent[3] to 97 per cent.[9]

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Cured is here used to mean cleared of evidence of infestation as determined by the scotch-tape smear technique.

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